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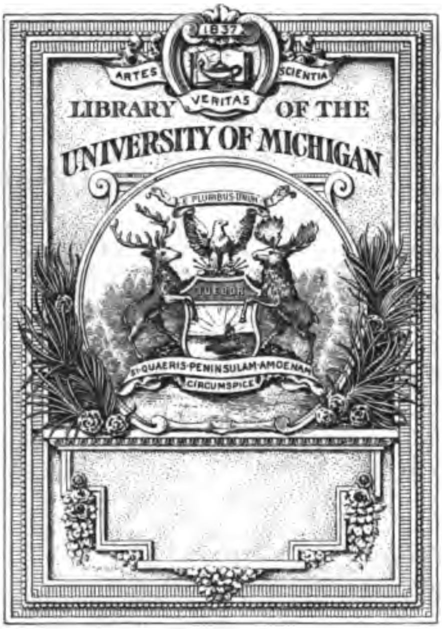
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President's Inauguration.

Iowa
State Agricultural College,
Ames,
November 9, 1886.

ADDRESSES

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DELIVERED AT THE INAUGURATION

OF

W. I. CHAMBERLAIN, LL. D.,

TO THE PRESIDENCY OF THE

IOWA state college of agriculture
and mechanic arts, Ames.

STATE AGRICULTURAL COLLEGE,

NOVEMBER 9, 1886.

AMES, IOWA:
PUBLISHED BY THE COLLEGE.
1886.

EXPLANATORY.

PRESIDENT LEIGH HUNT resigned the Presidency of the College in failing health in May, 1886, and W. I. Chamberlain, M. A., of Columbus, Ohio, was unanimously elected by the Board of Trustees to fill the vacancy. He entered upon his duties in July, the beginning of the second term, or half, of the College year. At his request the inauguration ceremonies were postponed until the close of the College year, the evening before the commencement exercises of the College, November 9, 1886. On the following pages will be found, in substance, the addresses delivered at the inauguration.

A formal reception and banquet were tendered President Chamberlain early in August by the Faculty, on which occasion were given the usual addresses of welcome on behalf of the Faculty, Alumni, and Students of the College.

This fact accounts for the omission of such addresses (except the brief one of Dr. Welch) from the inauguration ceremonies.

The exercises at the inauguration, therefore, were simply as follows:

ORDER OF EXERCISES.

Invocation....................................**PROF. W. H. WYNN**

Music—Piano Solo ....**MISS ANNA T. GAFF**

Address on behalf of the Trustees,
By **DR. S. P. YEOMANNS**, Member of the Board

Address Presenting the Seal of the College,
By **HON. WILLIAM LARRABEE**, Governor of Iowa

Address Presenting the Keys of the College,
By **HON. D. W. MOTT**, Chairman Board of Trustees

The Inaugural Address..............By **PRESIDENT CHAMBERLAIN**

Response on behalf of the Faculty,
By **A. S. WELCH**, LL. D., first President of the College

Benediction..............................By **PROF. W. H. WYNN**

ADDRESS ON BEHALF OF THE BOARD OF TRUSTEES.

By S. P. Yeomans, M. D., Member of the Board.

Ladies and Gentlemen:

It seems to me a very near approach to the absurd to press me to the front, with all this brilliant array before me for an audience, and the accumulated wisdom of the distinguished gentlemen around me upon this platform. I can account for the arrangement only from the fact that this institution is to a certain extent a military school, and that great battles are usually begun by the discharge of small arms upon the skirmish lines, the columbiads and heavy artillery being reserved for more effective work later on. I have not the remotest idea what I am expected to say or whom I am specially to address.

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The President of our Board of Trustees has been deputed to present to the President-elect the keys of this College edifice, and the Governor of our State has kindly consented to make the formal transfer of the great seal of this corporation.

If I had those keys, they might suggest some idea that could be unlocked for your edification, or upon the great seal might perchance be inscribed "In God We Trust," "E Pluribus Unum," "Sic Semper Tyrannis," or other mottoes which I could secure as a text; but not having either, I am strongly inclined to utilize one of the distinguished gentlemen who honor us with their presence to-day by making him serve as a text. I have long since learned not to despise the day of small things; history teaches us that a word spoken, a resolution made, or an act performed, though apparently of little moment, oftentimes generates impulses that roll on with the passing years and ages, ever accumulating strength and power until they overturn dynasties and determine for weal or woe the fate of individuals, states, nations, and even continents. If we go up the mountain side and observe the little rivulet ever singing its merry song in its journey towards the valley far below, it seems a small thing. A tiny child may turn it from its course; but follow it, and you will find that it joins others, and still others, until the great river is produced pressing on with an irresistible power towards the vast ocean, upon whose bosom floats the commerce of the world. In the exercise of the duty and privilege of citizenship a single ballot seems a small thing, yet an aggregation of these decides the fate of men and determines the policy by which the affairs of the nation are to be guided.

Seventeen years ago a meeting was held here to formally christen the Iowa Agricultural College. The College was but a weakly fledgling. Its legitimate purpose was not well understood. Its friends were not numerous, and its success was considered doubtful.

The distinguished educator who was then selected as President is with us to-day, still in the line of active duty, as earnest, zealous, and effective, and as confident of the grand success of this school now as then. I do not detract from the honor of his co-workers when I say that the College is largely indebted to the untiring and well-directed labor of DR. WELCH* for the wonderful progress made, and the high position already reached by the Iowa State Agricultural College.

We have had our trials and adversities in common with other schools, but in the surmounting of these has been demonstrated the wisdom and ability of those who had control. I am sure I voice the sentiments of the Trustees and all these friends as well, when I say to you, Dr. Welch, that you have done a grand work, the result of which will be more and more apparent as the coming years bring to view the full fruitage from the seeds which you have planted. The world's heroes have their marble monuments with deeply chiseled eulogies to commemorate their fame. We gaze with rapture upon the great works of art that adorn the old cathedrals, and we honor the genius which conceived and the skill which executed these great treasures; but in the progress of ages the marble column, however massive, will crumble to dust, the colors of the painting will fade and disappear, and the very warp and woof of the canvas will yield to the ravages of the great destroyer. But you, sir, have a monument in the memory of the men and women who have year by year gone out from these halls prepared for labor in the great field of industrial pursuits, whose symmetrical proportions will become more and more imposing as the rolling years follow in their successive course. You, too, have been an artist of the highest order. If you would see the canvas upon which you have painted, look into the smiling, intelligent faces before us to-day. That canvas is all radiant with immortality. No disintrigating process can dim the brightness of the coloring, or efface the impressions stamped upon it by the skill and wisdom with which you have wrought.

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*NOTE.—Dr. A. S. Welch was President of the College the first fourteen years of its history, and is now Professor of Psychology and of the History of Civilization.

To the class that graduates to-morrow, permit me to say that from what I have already said, and what I have heard others say, I fear that the darker phases of life's journey have been too prominently presented to you. I would not conceal the perils and the difficulties that lie in the pathway before you. I would point to them that you may avoid them when you can, and overcome them when you must. While I would have you go forth strong and confident, fully equipped as for battle, I would impress upon you the fact, that to a large extent we are the arbiters of our own destiny. Our Maker does not design that we should go through life clad in sackcloth. Lessons of peace and joy are taught us in the harmonies and symphonies of nature. The heavens above, the landscape beneath, the rolling ocean, the purling brook, the flowing river, the carrol of nature's songsters — all these are indices that the Ruler of all things designs that man should be joyous and happy. Do not fall into the error of supposing that the prizes have all been drawn, and that blanks only remain to reward you. There has never been a period in the history of the world when every field of human inquiry was so richly stored with concealed treasure as now. Your predecessors have been engaged in the work of surface mining. Their work has yielded rich results, and has at the same time demonstrated that the bonanzas have not yet been reached. To you is assigned this work. Nature has most carefully guarded these during all the ages, and nothing less than indomitable courage, strong arms, and clear heads will crown your efforts with success. It is to qualify you for this work that this Faculty has labored. And now the time has come when you are to go out, relying upon your own resources for that success which we hope will crown your efforts.

Do not imagine that your education is complete. Many who have stood where you now stand have been amazed that their heads could contain so much wisdom. But after they had tarried awhile at Jericho, and rubbed against the angularites and sharp points that you will all encounter as you go along, they have, on the other hand, been more astonished that so much room still remained for the storage of ideas. Nor would I have you conclude that the dicta of your teachers in science and philosophy are to be accepted with the sacredness of oracles which it would be sacrilegious to question. You have, no doubt, observed in your reading of history that as one generation has succeeded another, what had been deemed to be fundamentals and bed-rock principles, have been swept aside as closer investigation and clearer light has demonstrated their unsoundness. It is only by this process that real progress is made. Your teachers will feel complimented if in after years you shall return and demonstrate to them that you have discovered something new, even though it conflicts with what they may have taught you.

Be careful not to prove your lack of wisdom by assuming a knowledge that you do not possess, or attempting to explain the unknowable. It was my pleasure on a recent occasion to listen to a most interesting lecture by your Professor of Physics, on electricity. After its conclusion I asked him if he would please tell me what electricity was, and he very frankly answered that he could not do so. A few days since I visited your electric engine and dynamos, which so wonderfully produce these beautiful lights. I found a young man in charge who seemed to know all that need be done, and I asked him the same question, and his answer, unlike that of the Professor, was promptly given in the affirmative; but he declined to make the attempt.

In the great, busy, throbbing hive of human industry there is a multitude of workers, making strong the competition for the awards, but there is somewhere a niche for each one of you. Seek to find the one for which you are adapted, and then by industry, fidelity, and persistance you cannot fail to bring credit to yourselves and honor to your Alma Mater.

To you, President Chamberlain, I would say, that upon the resignation of your predecessor, the Board of Trusthes entered upon the work of finding the man best fitted in all respects for this position. We wanted a Christian gentleman, a man of culture, an experienced educator, a practical man in the full vigor of manhood, one familiar with all the details and wants of the great agricultural and industrial interests, and one having sufficient force of character to command recognition as the leader of this Institution. They believe that in securing you they have accomplished this end. And now, sir, in their name I charge you to remember that this is in a double sense an industrial school, designed first for the benefit of the sons and daughters of laboring men, the industrial classes, and that, therefore, we do not want wealth or position to confer any privilege or advantage within these walls. When young men and women apply for admission here. though poor and lowly, we desire you to open wide the doors and extend to them a cordial greeting, remembering that "a man's a man for a' that.' Again, it is industrial in this, that the instruction is to be both "theoretical and practical;" that is, to include not only the principles involved, but also the practical details of the farm and shop. We desire to send forth men and women educated morally and physically as well as mentally; not to become drones in society; not so skeletonized as to be fit only for specimens in an anatomical museum; not to be dudes and dudines to attitudinize before a wondering public as examples of Darwin's connecting link, but rather to be well rounded, symmetrical men and women prepared for work, and feeling that there is a significance in the fact that the Great Master was a carpenter and worked at the bench, and that Paul, the great apostle, was a tent maker. We want them taught the true dignity of labor; to be qualified to act well their part in whatever channel fortune may place them; to be useful members of society, loyal citizens, and active workers in all the great Christian and moral enterprises that are designed to make men happier and better. We believe that you will thus teach; and we extend to you a cordial welcome, and promise you our continued and united co-operation and support in all necessary measures to this end.

GOVERNOR LARRABEE'S ADDRESS

PRESENTING THE GREAT SEAL OF THE COLLEGE.

The address of Governor Larrabee, presenting the seal of the College, was wholly without manuscript, and his absence from the capital has prevented his writing it out in substance, as requested, for publication here. The editor of this pamphlet does not feel authorized to attempt to reproduce it from memory, even in abstract, further than to say that it was a clear and concise historical statement of the causes that led to the founding of the College; the purposes of the State and Nation in founding it; the early facts of its history; its growth up to the present time; the responsibilities laid upon the incoming President by the transfer to him of the seal of the College, and assumed by him in accepting it; the confidence reposed in him by the people of Iowa; and the earnest hope and confident expectation that President Chamberlain would, by a broad, liberal, and Christian administration, justify that confidence.

ADDRESS OF HON. D. W. MOTT,

CHAIRMAN OF THE BOARD OF TRUSTEES,

PRESENTING THE KEYS OF THE COLLEGE.

Mr. President, Ladies, and Gentlemen:

In accordance with the programme for this evening, two duties were to be performed by the Board of Trustees; one of their number was to deliver the address of welcome to the people and to the new President, and one was to present to him the keys of this institution. The Trustees selected wisely for the first duty; they wanted a speech — they selected a man who could make one — Dr. Yeomans. It now devolves upon me to present the keys of this institution to

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its duly elected President. Before doing so, I wish to add a few words of explanation to the able remarks of Dr. Yeomans. Two years ago the board appointed a committee to select a President for this College. Our committee conducted an extended correspondence throughout nearly if not all of the States between Iowa and Massachusetts, and including these two. Letters of inquiry and letters of recommendation were sent and received for over two months, and all these letters were presented at our meeting in Des Moines, January, 1885. The report of the committee placed at the head of the list Mr. W. I. Chamberlain, of Ohio, saying that he, in their opinion, was best qualified to head a real live institution as a practical educator. To our disappointment, though we were ready to elect him as President, he was not willing to accept. He had not asked for the position at that time, nor at any time since, and at that time could not, as he thought, leave his work as Secretary of the Ohio State Board of Agriculture. Our committee did their work without fear, favor, or prejudice, with only one aim in view — to find the right man for the place.

The board then selected Mr. Leigh Hunt to fill the President's chair, which he accepted, and I believe he did his work to the best of his ability. I also believe that each and every one who has held the keys to this institution has done a good and glorious work, and is entitled to far more credit from the people of this State of Iowa than they have received. They have built up a glorious institution, second to none in the West. As proof of this, I point to the graduates who have gone forth from this College, scattered through this and other States as agriculturists or representatives of the various industries that are taught here. It is true there have been troubles here, largely magnified by outside parties who know very little of the real facts, but anxious to gain a little cheap notoriety in the local press, and read by those who know but little of the real work here, and care less. It is a matter of surprise still that so small a number of the people of this great State are acquainted with and fully appreciate the great work going on at this Iowa Agricultural College.

If they would come and see it and examine the good work done here, these buildings would not have room for one-half of the applicants.

Six months ago, owing to the failing health of President Hunt, we were again compelled to select some one to fill the executive chair.

The Board concluded to try again to secure the man of their choice, the one who had never sought the position, but who had been sought by us, for we believed him to have the ability to fill this, a dual position—President of a literary, scientific, and practical educational institution. I refer to W. I. Chamberlain, of Ohio. At our May meeting the committee were enabled to report that he would accept the position, and the board at once unanimously, on their first and only ballot, elected him President of the Iowa Agricultural College. The committee did its work faithfully and well, and the large number of letters received in answer to inquiries had but one opinion as to Mr. Chamberlain's fitness.

And now, President Chamberlain, I place in your hands the keys of this institution; I also, for and in behalf of the Board of Trustees, promise you our united and hearty support, and the honest co-operation of each and every member, that you may be enabled to make this College all that it was intended to be, and make it continue as it has been, a College which helps to make young men and women capable of taking care of the industries of this great State—capable of earning, making, and appreciating the homes of this country.

Take these keys, Mr. President, and guard them well. Fling wide the doors of this College to every honest, earnest worker of every nationality; lock and bar them fast against all communistic and nihilistic tendencies, not by suppressing discussion, but by turning on the full blaze of the light of political, social, and moral truth.

Admit manhood and womanhood; teach scientific, social, and moral truth, and you shall graduate manhood and womanhood strong and true and noble.

Again I bid you take these keys and guard them well.

PRESIDENT CHAMBERLAIN'S INAUGURAL ADDRESS.

INDUSTRIAL EDUCATION.

Governor Larrabee, Gentlemen of the Board of Trustees, and Ladies and Gentlemen:

I accept the seal of the College and the other insignia of authority and responsibility now formally presented, and promise with God's help to be faithful to the trust. My predecessor, as you know, resigned from failing health, and I was elected in May, and took charge at the beginning of the second half of the College year. This half year of actual service has given me the best opportunities for continuing the study of industrial education — a favorite study with me for years — and also for becoming acquainted with the resources and the needs of this College. I enter, therefore, at once with you upon the discussion of both topics.

Industrial education needs no defense here, in the house of its friends. Only those who are ignorant of the facts longer sneer at agricultural and industrial colleges. The breadth of their resources, the extent of their equipments, and the wisdom of their methods of instruction and training, are coming to be acknowledged. Cornell, in New York, and the State Agricultural and Mechanical colleges of Michigan, Iowa, and Kansas, for example, have reached that stage of wide and prosperous usefulness that cares little for carping criticism or attempted ridicule. The whole tide and trend of the best thought of the day favors the kind of training given in these colleges, as witness the recent utterances of the Presidents of Johns Hopkins and of Harvard Universities.

I wish, *first*, sharply to point out what I consider to have been the faults and defects of the old-time college course; *second*, to note the need of new subjects and methods of investigation and instruction; and, *third*, to speak of the advantages and limitations of the industrial and technological schools.

FAULTS AND DEFECTS OF THE OLD COLLEGE COURSE.

For many centuries the schools and colleges trained the mind alone, to the neglect of the eye, the hand, the body. They gave an education, passive rather than active; knowledge, rather than the power to use it; they taught to be, rather than to do; they hewed timber, but never built the house. The eye was simply used, not trained; used, too, mainly as a mere avenue to the mind, or a means of conveying to it language, and thought through language. The hand was, if possible, still less esteemed; simply used to turn the leaves of books, or to convey facts and ideas to the mind by the sense of touch, not trained to execute the behests of the mind except in written language. Indeed, eye, hand, and entire body seem to have been despised by college and church men. The human body, in literature and religion, has been deemed a clog, a hindrance, a damage to the mind and soul. The study of the human frame, its structure, adaptations, limitations, needs and means of healthy improvement and action, has been sneered at in our old-time colleges, while in our churches, monasteries, and nunneries, we have been exhorted to "mortify our members," not as St. Paul uses the term, of evil passions and lusts, both of mind and body, but in an ascetic sense. The assumption seems to have been that it was an amazing blunder that the Lord Almighty gave us such bodies, with their wants; or that they were given for discipline or even torture. The body has been named "a vile body," a clog, etc., although St. Paul himself more wisely calls it the "temple of God."

Blunder or not, the facts are that we have these bodies; that they are integral and inseparable parts of that personality we call ourselves; that when these bodies are properly fed and cared for, and the laws of their organism obeyed, they are healthy and our minds can work well, otherwise not; that they, the bodies, not only furnish the only avenues through which our minds are sensibly reached, informed, educated, made happy, but the only means by which that education can be made of any value to the world.

To me, therefore, the amazing blunder seems to have been, not on the part of God, who joined our minds and bodies, and said more unmistakably than in the case of marriage, "What, therefore, God hath joined together let not man put asunder;"

—the blunder, I say, seems not on the part of God who joined the two, but on the part of men that have tried ever since to put them asunder, especially in matters of education. Let us state man's blunder sharply. The mind must work through the body, or not at all. The trained mind can work well only in and through a healthy and well trained body. On the other hand, the trained eye, hand, and body are little worth, without the trained mind to guide them. And yet our schools have trained the minds and neglected the bodies of one set of men, and our farms, trades, and machine shops have trained the bodies and neglected the minds of another set of men, and then we have wondered that the world's progress was so slow. The college graduate of thirty years ago, after twelve years at school and college, spent mainly in studying words, language, thought, abstract relations, and knowledge of the past, the absolute, and the necessary, found himself suddenly launched into a world of living men and concrete facts. Now he must meet men as rivals and antagonists, not as fellow students or kindly, helpful instructors. He must handle tools and machines, and deal with forces, of which he had scarcely even read. He knew much; much, too, that was valuable as a mental training, and indirectly valuable in some lines of professional work, but he could do little in the way of the world's widely varied activities; for he had not been trained. Yes, he had been trained to think and speak, but not to do; and he soon found that thoughtful doing in this world is in far greater demand than thought and speech without the doing. His college course had almost ignored industrial pursuits and the training that fits for them, though the whole fabric of modern civilized society rests upon and is fashioned by industrial pursuits. His college course of thirty years ago trained simply mind and tongue and pen to form and utter thought, not eye and hand and body, as skilful agents of the mind, to do its bidding.

Now, then, was this cramming of knowledge without the development of skill, or the training to skill without knowledge, was either wise? Was either, at best, more than half education? Did either train for highest usefulness? Look at it in this way for a moment. Take a man with his powers, senses, members, faculties. Begin now, in your imagination, the process of lopping off in various ways, and watch the residue each time. Take away the mind and you have the idiot, the utter imbecile, helpless even as an animal, with not even the supple limbs, tough stomach, and cunning instinct of the monkey to get subsistence. Restore now the mind and take away the hands, and give hoofs instead, and the man is almost like the horse that must be harnessed by another to his work. Restore now his hands, and let him keep his mind but lose his sight. He can do little as an active worker, but he can conquer the whole course of study in our old-time colleges, and for the two professions to which it most contributed, law and theology. Hon. Walter Campbell, lawyer, editor, and ex-Mayor of Youngstown, O., blind from quite early childhood, graduated at my own alma mater in 1867, with second rank in scholarship in a fine class. So wholly literary, abstract, intellectual was the ordinary college course of twenty or thirty years ago, and so little did it fit one for active employment, that a bright man, blind or deaf, and even without hands, could take high rank in the whole course. Is this the best training for life's varied work, for men that are blessed with eyes and ears and hands—this that trains mind alone and neglects the training of eye and hand and active energies and faculties? The human eye and hand are the most wonderful created instruments, capable, too, of marvellous development; the two chief means by which man's mind uplifts humanity. And yet the old-time college course ignored them, while the trades and handicrafts ignored the training of the mind. If the thinkers had been trained to do, and the doers to think, what an uplifting of the human race there would have been. It takes both mind and body, both thinking and doing, both knowledge and skill, to subdue the earth and make the mighty forces of nature do man's bidding. Then why not train mind and hand and eye together? Why train the mind alone of one set of men, and the hands or eyes alone of another set of men, only to work at cross purposes? Why "put asunder what God hath joined together?" Why refuse to see that "knowledge is power" only when it is applied knowledge?

THE EARLY SLOWNESS OF INVENTION.

Now, how much real progress was there under this kind of instruction? You will hardly dissent from the opinion that there has been more uplifting of the common people intellectually, more improvement in their physical condition, more advance in the beneficient applications of science to human welfare, in the last century than in the other twenty or more since the brilliant days of Plato and of Euclid. We must admit, too, that this advance has been very largely due to the joint training of mind, eye, and hand in mechanical, physical, and chemical science. And how marvelous has been the transformation. This century since 1780 has witnessed the real introduction of the steam engine (Watt, 1784), the spinning jenny (Arkwright, 1779–82), the power loom (Cartwright, 1785–87), the cotton gin (Whitney, 1793), the steamboat (Fulton, 1807), the locomotive and railway (Stephenson, 1814), while the past half century, or a trifle more, has given us the amazing and most beneficient applications of mechanical, chemical, and electrical science to human use, the telegraph, telephone, electric lights, electro-plating, Bessemer steel, aniline dyes, and the other aids of chemistry, physics, and mechanics, in manufactures, in agriculture, and in commerce, that have made the old myth of the hundred handed Briareus an actual and familiar verity to-day. Physical science, joined to handicraft, and not the science gained by retrospection or by introspection, has (as I had occasion to say in substance, recently, in another address) increased an hundred fold the power of man, changed night to day, annihilated space, abolished time, made steel as cheap as iron, utilized waste products, reclothed with verdure barren fields, improved our textile materials and fabrics, our fruits, grains, vegetables, meats, modes of cooking and living, our public health, has brought constantly broadening knowledge, comfort, and culture to our homes, and given all intelligent and faithful workers the power to live like kings and princes.

What might not our schools of learning have done for the race, had they twenty centuries ago begun the kind of work, studied the class of subjects, and used the modes and means of research and training now found in our best technological schools. For twenty centuries the schools, one might almost say, redug the mines, replowed the fields, and threshed again the straw of Grecian learning. They imitated the Greeks, instead of emulating their originality. They garnered precious seed, and, fearing to plant it lest it should be lost to the world, they wrapped it as in the winding-sheet of an Egyptian mummy and kept it safe for centuries. Like Lot's wife, they looked back, and like her they seemed turned into pillars of salt,—salt to preserve the learning of the past.

THE SPIRIT OF INVENTION.

At last physical science, joined to handicraft, sprung up against the protest—nay, under the very ban of monastery, church, and university, and wrought its amazing and most beneficient achievements. On its banner were emblazoned the very words of Christ, "He that putteth his hand to the plow and *looketh back* is not worthy of the Kingdom of God." It ceased to repine over a golden age of vanished splendor; its eyes looked forward and its hands worked in the present, and for a better future. Inside, and especially outside, the universities and colleges, a noble company of workers abandoned imitation, sought new methods of research, put questions to nature and demanded answers, trained eye and ear to perceive her facts, and hand to yoke her mighty forces to the car of human progress. Not till then had the race accomplished real results in physical lines. Since then what amazing progress has been made—made, too, as soon as we even began to give to physical science the wealth of study once lavished upon the metaphysical!

THE OLD-TIME COLLEGES AND THE SPIRIT OF INVENTION.

Now, it is painful to notice how little impulse the colleges and universities gave to this new spirit of investigation, discovery, and invention. The physical sciences were grudgingly given place in their courses of study, and were often snubbed and dubbed the "bread and butter sciences." Scientific students are even yet deemed in no wise the equals of the classical students, and the degree of Bachelor of Science has been deemed inferior in honor to that of Bachelor of Arts. Where the natural sciences have been taught in our older colleges, it has not been in the practical way of training eye and hand with mind; the way adopted in the technological and scientific schools of later growth, and adapted to train up a strong body of practical physicists, chemists, mechanical engineers, draughtsmen, skilled handiworkers, discoverers, inventors—men who should have both the thorough scientific knowledge of the principles involved, and the practical skill in draughting, modeling, handling, and even making tools and machinery, that should enable them to apply this scientific knowledge to supplying the wants and increasing the comforts of mankind. The men who understand the principles of science should be the ones to put them into practice, or at least suggest their utilization. But notoriously our old-time college graduates have not been our inventors, or even the discoverers of the useful relations and possible practical applications of scientific truth. Save three (that is until quite recently), I can not now recall any of our world-moving inventions that were the work of college men, and these were clearly the results of special individual aptitude and tendency, and of subsequent favoring and impelling circumstances, and not the result of their college training. That had given them another bent entirely.

THREE GREAT INVENTORS AMONG EARLY COLLEGE MEN.

Whitney, the first I name, was indeed a graduate of Yale College, but he chose the profession of the law. He happened to be studying in Georgia, where he noticed that it took a negro woman a full day to pick and clean a pound of cotton from its seeds. General Greene's widow said to him, in substance, "If I were a man, I believe I could make a machine to do that work faster." His Yankee whittling genius helped him to make the required machine — yes, to make the very tools and supplies with which to make it. But his college training had turned him towards *the law*, not towards science, mechanics, or invention. Yale seems to deserve no special credit for the invention of the cotton-gin.

Dr. Cartwright, the second I name, the inventor of the power loom, was a graduate and fellow of Oxford University; took orders in the established church, and gave himself almost wholly to literature and poetry until his fortieth year, when a curious chain of circumstances revived and developed his skill and inventive genius, which literature and poetry and the university atmosphere for twenty-five years had not been able entirely to smother.

Morse, the third I name, the inventor of the telegraph, was a graduate of Yale College, and had a natural taste for physics and chemistry, which his college course had no effect to stimulate, for he chose the occupation or profession of painting and sculpture, which developed a kind of art or handicraft not specially encouraged or aided in any regular college at that time. Finally, only a most curious combination of circumstances in after life brought him back into his true realm of physical and chemical research and invention. Not only did not Yale and Oxford develop and quicken the natural bent of mind in these young men, but they well nigh smothered it in all three. The tendency of the colleges has been away from the practical even in science. In those of the physical sciences that they have taught at all, their investigations and instructions were for a long time rather about the curious facts and abstract relations and laws of pure science, than in regard to the useful applications that might be made. For example, steam and electricity were curiosities and playthings among the learned for centuries, as I shall show presently. The college men learned principles and abstract relations alone, while the men of the shops and mines gained only skill of eye and hand. And so the one class lacked the skill to make its knowledge of best use to man, and the other lacked the knowledge to guide its skill into new and useful channels.

THE MAIN SOURCE OF OUR INVENTIONS.

The vast bulk of our inventions, until recently, have come from below, not from above, from the men that actually handled the machines and tools, and saw the need of the inventions, not from the men who had the learning of the schools, and presumably the knowledge of the principles involved. George Stevenson, the inventor of the railway locomotive, the father of the railway system of the world, was an ignorant fireman in a Scottish coal mine. He could not even read and write at eighteen years of age, and it took two long years in night schools to give him thoroughly these first two stepping stones to knowledge. Fulton, the inventor of steam navigation, lost his father when three years old, had a scant purse and a scant common school education. He became a miniature painter, and finally, long after he became of age, studied civil engineering. Watt, the real inventor of the steam engine, that is, of the modifications that made it of practical value, was a maker of mathematical instruments, with very superficial knowledge of the principles of mechanics. In these three cases, inborn force of character and mechanical genius overcame the lack of knowledge, or rather acquired and used the knowledge when its need was felt. But most men of inventive mind and little education have not the force and patience for this. And so the shelves of our Patent Office are crowded with inventions that violate the first principles of mechanics. When shall we learn to train mind and hand and eye together; to teach both students and handiworkers the facts and principles of science, and train both to put them to beneficent uses?

GERMS OF INVENTION DORMANT FOR AGES.

What an amazing commentary on the efficiency of the old systems of education is found in these two groups of facts. First group. Hero, of Alexandria, B. C. 250, discovered or invented the germ of the steam engine. For more than twenty centuries the learning of the schools failed to develop that germ, till an unschooled English mechanic practically gave us the steam engine, an ignorant fireman in a Scottish colliery gave us our railway system, and an uneducated American miniature painter gave us steam navigation. Second group of facts. Thales, of Miletus, B. C. 600, produced and described electricity; yet the learning of the schools and monasteries for more than twenty-four centuries failed to make electricity of any use to mankind, until an unschooled though not unlearned Philadelphia printer proved its identity with Jove's thunderbolts, a sculptor and painter of New York invented the telegraph; and since this utilization of steam and of electricity the mass of mankind has been uplifted more than in the twenty centuries before. Where might not the world have been to-day in advancement, if the steam engine and the telegraph had been invented twenty centuries ago? *Why might they not have been invented* if the schools had trained eye and hand as well as mind, and had trained all three to do beneficient work here, in this present time, with and by and through Nature's mighty forces, instead of training the mind alone, and training even it to dwell mainly on the metaphysical or the past and the remote? Our old-time colleges seemed to be teaching land-swimming. Our industrial and technological colleges are now trying to give the boys a chance to strike out in the water—to learn something of their life-work and its environment.

THE NEW EDUCATION AND ITS JOHN BAPTIST.

I notice, *second*, the need of new subjects and methods of investigation and instruction. I have strongly stated the defects and faults of the old-time college training, perhaps too strongly; but I have done so as the best means of pointing out this need of new subjects and new methods.

More than three centuries ago Sir Francis Bacon pointed out the defects and the remedies quite as sharply. As a student in Trinity College, Cambridge, in 1573–7, he conceived a dislike for the philosophy of Aristotle and the methods of instruction then in vogue. He said: "They learn nothing at the universities but to believe. They are like a becalmed ship; they never move but by the wind of other men's breath, and have no oars of their own to steer withal." After leaving Cambridge he published in pamphlet form a criticism of the universities, in which, having premised that the existing colleges were established simply to communicate the knowledge of our predecessors, he proposed that a college be set apart for the discovery of new truth, "to mix like a living spring with the stagnant waters." These were the criticisms of his youth. But his "Novum Organum," which was not printed till 1620, when he was 60 years old, had been the burden of the thoughts of his life, and was written with the greatest care. In it he proposed the new and solid principle of *investigating nature*, instead of the Aristotelian principle of mere verbal dialectics. He held that study, "instead of employing itself in wearisome and sterile speculation, should be engaged in mastering the secrets of nature and of life, and in *applying them to human use.*" To us, now, this seems like a genuine inspiration, almost a revelation from on high. His method for the attainment of this end was "rigid and pure observation, aided by experiment and fructified by induction." Instead of mere hypotheses he asked for "facts gathered by watching nature's workings, or skilfully extorted by instruments and trials, and carried forward by careful generalization from the world of the known to that of the unknown." He declared himself to be only a finger post to point the way to others; but it is a noteworthy fact that he not only pointed out the general methods and lines of investigation adopted by the school of scientists that has since made science of beneficent use to mankind, but even minutely described some of the particular experiments needed and afterwards actually performed.

Herein we find the germ of modern scientific research, and finally of technological schools. Bacon was the John Baptist of the coming era. But his book was received with ridicule and hostility, especially by the schoolmen who regarded Bacon as guilty of sacrilege, as an iconoclast, in thus profaning the temple and the very images of ancient learning, and questioning the methods of Aristotle.

THE SEED SLOW IN GERMINATING.

How slow this seed of truth was in germinating may be seen from this remark of Sir Charles Lyell's biographer: "At this time" (1825, the time when Lyell abandoned law to devote himself to geological research), "*mere geological speculations* for which the previous half century had been distinguished, had at last given place to the systematic investigation of nature." How little the regular universities had to do with this advance may be seen from the fact that Oxford, true to its instincts and antecedents, had made *a lawyer* even of Charles Lyell and he thus came very near being lost to the scientific world. Hugh Miller at about the same date was a geologist without the college training. Charles Lyell became one in spite of it, though greatly aided by its mental drill, as we must admit, when once he entered on the study of science.

THE SEED FINALLY TAKES ROOT.

Time forbids that I should follow up the seed sown by Lord Bacon, and show how it germinated in many parts of Europe, and finally grew up late in the eighteenth century into industrial, technological, and training schools, that not only heralded but helped to bring the scientific glory of the nineteenth century. Schools of this kind were of much later growth in this country than in Europe, and were, as a rule, established independently of the older colleges, which at the first held them in contempt. They were established chiefly upon private donations from men who felt the need of new impulse and direction in education, or upon the Congressional land grants of 1861-2, for the establishment of colleges "for the benefit of agriculture and the mechanic arts."

THE NEED OF TECHNOLOGICAL SCHOOLS IN AMERICA.

The need of such schools was even more urgent, on the mechanical side, here than in Europe. For here we were in no way training skilled workmen. The apprenticeships were dead, and there were no guilds to foster the trades as formerly in Europe. We were importing skilled artizans and trained mechanics from that country, or, still worse, were importing their finer products, such as silks, linen, velvet, cut glass, porcelain, ornamental pottery, and the like, with no native-born Americans trained to the necessary skill for their production. Our American youths were crowding the so-called learned professions that require no physical toil and no skill of eye or hand, or were drifting into trade like veritable sons of Israel. It was far past high time for technological schools to be established for the training of mind, hand, and eye together. Many of them are doing excellent work with which you are familiar. At vast expense the best facilities are supplied for actual educational hand-work, manual, and ocular training in connection with the theoretical principles involved. The best of these schools (and this of ours is one of the best) require from one to two hours daily of actual hand and eye training in cabinets, machine shops, fields, and laboratories (chemical, physical, mechanical, botanical, zoological, geological); in drafting room, in modeling and moulding room, at the forge, bench, power lathe; in green-house, nursery, orchard, dairy, barn, stock-yard; and in military drill. All this is training, not mere drudgery. It has a direct educational purpose and value. It gives knowledge with skill, knowledge more rapidly than can be given without such drill, and skill more rapidly and in far greater variety than any apprenticeship can give it. For the apprentice can only absorb knowledge as best he may while making money for his master, which is his master's prime object; and hence his skill must be also in narrow lines.

ADVANTAGES OF THE LABORATORY METHOD OF INSTRUCTION.

These colleges seem to have certain advantages over the old-time literary and classical ones.

First — Schools that use this method keep their students in sympathy with, and not above intelligent, skilful hand-work. They teach that it is no disgrace to use the hands and bend the back and soil the clothes. Though I deem this point of great importance, yet I must not dwell upon it.

Second — This method of training hand and eye and body with the mind, develops the physical powers, invigorates the health, and utilizes the natural force and bodily activity that might otherwise go to college deviltry, and even to vice and sin. In point of fact, "class rushes," "hazing," and other tricks and evil deeds of boyish exuberance are far more rare in schools pervaded with the industrial idea; for

> "Satan finds some mischief still,
> For idle hands to do,"

even if the mind is kept active. The young man's physical energy must have a physical safety valve.

Third — The useful sciences are made, in part, the means of mental discipline. It has long been assumed, but never proved, that the mathematical and physical sciences, the "bread and butter" sciences, if you please, do not furnish so good a mental discipline as the literary and metaphysical studies. It might be said in reply, that the degree of discipline depends largely upon the intensity of application, and that few studies are better adapted to secure this than the sciences as studied in our technological schools. Also that we are not seeking for mere mental gymnasts, but for useful workers that shall have the knowledge, the power, and the desire to benefit mankind. But I think the true answer is this: That the physical with the metaphysical and literary studies gives better discipline than the latter can do without the former, and that we do not propose to discard, but wisely to use, the literary, historical, and metaphysical with the physical; in short, to make our course here "broad, liberal, and practical," as required by law.

Fourth—and most important, the experimental, industrial, or laboratory method of study and instruction, not only gives the student the power to use his knowledge to advantage, but even gives him a far better and fuller understanding of the theoretical. You learn little of chemistry from book and teacher alone. You must handle your own blow-pipe and chemicals before you know *them* and not merely *about them*. You learn little of geology from books, without a working cabinet, and a teacher to show you how to use it,—show the actual things that the books describe, in quarry, mine, railway cut or tunnel, or upheaved mountain rocks, where nature's mighty forces formed and modified our earth, and left there the visible "footprints of the Creator." The senses must be used on sensible objects, and trained to clear perception. Though I describe a strawberry ever so minutely to him who has never seen one, he gets no notion of it. But if he sees, smells, and eats one he knows what a strawberry is. Long verbal descriptions of Alpine chasms convey little idea, while actual sight or even stereoscopic views make you acquainted with the very objects. Knowledge of and skill in mechanical and perspective drawing not only makes solid geometry and mechanics clearer than it is possible without, but opens wide the door to useful invention. It is a most significant fact, which I do not remember to have seen stated in its true relations, that two of the greatest and most beneficent of the world's inventions were the brain-work of two portrait painters, Morse and Fulton. Their power to embody their ideas in visible form and color was found to be a great help even then. Now, skill in drawing is recognized as the highway to invention.

The motto of this College is, "Science with Practice," and even our oldest colleges and universities are beginning to believe that practice is the road to science, that is, to classified knowledge. The truth is worthy of the very lips of Christ, "If any man will *do* His will, he shall *know* of the doctrine." Soon all our regular colleges and universities will, I believe, be compelled to give the fullest facilities for scientific hand and eye training to aid the training of the mind.

LIMITATIONS OF INDUSTRIAL EDUCATION.

For colleges like ours, whose funds come from the Congressional land grants, the chief limitations are in the law that made the grants. That law should be fairly construed and honestly and cordially obeyed. It seems specific. Its very title names these institutions "Colleges for the benefit of Agriculture and the Mechanic Arts," and the act provides that "the leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, * * * in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life." Several points seem clear. The act requires first — that the "leading object be to promote the education of the industrial classes;" second — that such education be both liberal and practical, that is, it is not to be mere manual training; third — these colleges shall educate the industrial classes in the several pursuits and professions of life; fourth — the act does not in itself definitely exclude "other scientific and classical studies," — any such study may or may not be in their courses; fifth — the act does definitely include military tactics.

It seems to me that this is a fair analysis of this famous section that has caused so much discussion. It would seem plain from this analysis, and from the known facts of history in regard to the passage of the act, that the intention of Congress was to found a class of colleges *essentially different* from the class that then existed in the country; viz., in the main, literary and classical colleges, founded chiefly to educate young men for the

Christian ministry (a noble end), or for law, medicine, and literature, with courses of study adapted to those ends, and in point of fact actually sending the bulk of their students into the so-called learned professions. Up to several years after the time that the land grants were made, the classical colleges drew half their students from the farms, and returned only one out of fifty of their graduates to the farms; that is, of the farmers' boys that came to them, they sent back to the farms *only one in twenty-five.* The percentage was probably about the same for the mechanic arts.

Now, it seems plain that if these new colleges were, by the very title of the act, to be "for the benefit of agriculture and the mechanic arts," and if their "leading object" must be, by law, "to teach such branches of learning as are related to agriculture and the mechanic arts," then their subjects of study, their methods of instruction, and their entire atmosphere and tendency, must be different from those of the old-time colleges, founded to educate men for the Christian ministry and the learned professions. Otherwise these "industrial and agricultural" schools would be found taking twenty-five young men from the farms and shops to every one they returned to them, a doubtful "benefit." This matter seems to be clear and plain. And yet, oftentimes the Presidents of these land grant colleges, like myself, graduates of classical colleges, but not like myself, in after life, in the providence of God, thrown into earnest sympathy with the interests of agriculture and the industries, have in their inaugural and other addresses used their wealth of logical and rhetorical resource in trying to prove that the law of Congress compels about the old-time classical and literary courses in these new colleges. With sadness I am compelled to believe that oftentimes "the wish is father to the thought."

I am glad to say that I believe the men placed in charge of this College from the first have tried faithfully, often imperfectly, sometimes, perhaps, mistakenly, but always, I think, honestly, to carry out what they sincerely believed to be the real purpose of our endowment. That is the only thing an honest man can do when put in charge of sacred trust funds like these. Two questions only can he raise: First, what is the end for which the trust was created? Second, what means will best secure that end? The seal of my own alma mater bears this inscription, "Christo et Ecclesiae," "for Christ and for His Church." The good men who gave that college her endowments gave them for the advancement of Christ's kingdom in the world. As a trustee of that Institution I am solemnly bound to help to keep her faithful to that work, in the spirit of her founders. As President of this Institution, I am even more solemnly bound to do my utmost to keep it to its proper and distinctive work of promoting the agricultural and other industrial interests of the great State of Iowa, and doing it in a broad and liberal way. And I am glad to believe that this will in no small measure help to advance the kingdom of God in this world. Indeed I am convinced that our material interests cannot be promoted apart from or in opposition to God's kingdom.

If this College shall succeed in planting the feet of all its graduates and students on the bed-rock of integrity, truth, and honor, its work will indeed be blessed.

TO OUR SISTER COLLEGES IN IOWA.

Have I criticised the old-time college course with too great severity? It has been with still greater sadness. I can never forget the debt of gratitude I owe my Alma Mater, an "old-time college," and especially my Professor of Greek and Latin, who, more than all other influences combined (except that of my own mother) helped to give me whatever power I have to think, speak, and write with clearness and force. But, on the other hand, I can never forget the irreparable loss by me sustained because of the slowness and apparent unwillingness with which my Alma Mater admitted—nay, has scarcely yet admitted, much of the practical in science, both in subject matter and in method of instruction. I am consciously less of a man by reason of it, and must accomplish less in the world.

But my words need give offense to none of you. There is scarcely an "old-time college" in the State. All are more or less permeated with the spirit of the "New Education," the "Laboratory Method" of instruction, in whatever is taught. All have freely admitted most of the "beneficent sciences" into their courses, and are trying to teach them in a practical way. All, I believe, are trying to give an active, rather than a passive education; to train to do, and not simply to be or know. All, or nearly all, give equal rights of study to women. But most of you are, very properly perhaps, giving a larger share of your attention to language and literature, and to introspective and retrospective studies, than is, in the opinion of Trustees and Faculty, authorized hère by the spirit of the Congressional and Legislative acts that gave us our endowments.

Thus the field is wide enough for all. An army needs infantry, cavalry, and artillery; captains, colonels, generals. You are largely preparing men for the learned professions, especially for the Christian ministry; we mean to train them to stand up as stoutly for God's truth, outside the pulpit. Engineers, civil and mechanical, doctors and veterinarians, prominent men in agriculture, horticulture, railroading, manufacturing, commerce, business, law, and even the ministry occasionally, — these will be, as in the past, the men we shall send forth; and women fit to be mothers of men that are to constitute and rule our nation, or that shall themselves enter the industries and professions, as one after another they fling their doors wide open to them; men and women with pure hearts and clean hands, as far as this college can make them so. Such are the three hundred and fifty graduates and the thousands of students this college has sent forth in the seventeen years of its history. There is no need of jealousies. The field is wide. We shall all have more students than we can properly care for. Those who desire an extended literary and classical course, with less of practical science, will naturally come to you, just as those who desire extended courses in the physical sciences, and large facilities for drill in their useful applications, but less of literary culture, will naturally come to us. We have frankly said that our work is not, and we think should not be, exactly like yours, though yours is far from being like the old-time work I have described. We bid you hearty Godspeed. We will work earnestly with you to send forth a large body of young men and women that shall, physically, mentally, and morally, be the strength and glory of our noble State.

TO THE TRUSTEES, FACULTY, AND STUDENTS OF THIS COLLEGE:

Your unbounded cordiality and kindness during the half year since I came to you as a stranger from a distant State have placed me under deepest obligations to you all. I can repay such kindness only by faithful service, which, God helping, I will render.

TO THE WOMEN OF IOWA:

Since this is a State institution, the daughters of the State have the same right with its sons to its several courses of study. Co-education is not an open question, but a settled fact here, and the Faculty of the College believe in it. Complications grow out of it, especially under the dormitory and boarding system made necessary by our location. But it is my opinion after several years' experience as student and teacher in other institutions, part with the two sexes and part with only one, that the anxieties and complications and disadvantages are usually overestimated by those who do not have actual knowledge of the facts, and that they are more than overbalanced by the improvement in the order and gentlemanly and lady-like character—rather let me say in the manliness and womanliness of the students. Monasteries and nunneries have not been found to develop the noblest types of manhood and womanhood.

TO THE FARMERS OF IOWA:

In 1858 our General Assembly passed an act to establish "A State Agricultural College and Model Farm." In 1859 a part of this present farm was purchased for the use of the College. That College and Farm were intended to be wholly an agricultural institution, but I can not find that any buildings of importance were erected, or any school really established. In 1862, as you know, our General Assembly accepted the Congressional land grant, under its conditions and restrictions, and combined with it that incipient State enterprise. That action made this College a "College for the benefit of agriculture and the mechanic arts."

Now, it is not at all strange that the farmers of the State should, many of them, still feel that this is their College, and should feel also that it should be exclusively an Agricultural College. It was, as seen, originally founded for one. The national land grants were largely the result of a direct pressure brought to bear upon Congress by the agricultural interests. When the College was founded, the agricultural interests greatly predominated in Iowa, and the other industrial interests were in their infancy. The College, too, is ordinarily called "agricultural" with no mention of other industries. Naturally, therefore, many farmers have come to think that it should be wholly agricultural. A clear knowledge of the facts must correct this mistake. By the acceptance of the National Trust Fund our Legislature necessarily placed agriculture and the mechanic arts on an equal footing in the College. A faithful and true administration on the part of myself and my associates in the Faculty must ever do the same.

But I think you can afford to trust me in this matter, my brother farmers, and to confide in the Trustees and Faculty that work with me, and who, I believe, share my views. All my own instincts and antecedents compel me to be true to agriculture. If I have gained a national reputation at all, it is with the farmers; and it has been gained by fidelity to and sympathy with their interests. "In season and out of season," some have thought, I have insisted that the land grant colleges should be true to the idea of their endowments, especially as related to agriculture. It now becomes my solemn duty to see that this College is as true to the mechanic arts. You can best help this College to help you, by cordial confidence and sympathy, not by distrust. I pledge you my word that so far as my utmost influence can go, the facilities for the study of the principles that underlie agriculture and horticulture as a deep science, and of the facts, processes, and details that belong to it as a most difficult and most fascinating art, shall be as full, complete, and generous as in the other half of the work given us by Congress to do. Give us your confidence. Send us your sons and daughters imbued with the farm and the home idea, eager to return at graduation and go into partnership with you, and see if the scientific acquirements of the son or daughter, added to the practical wisdom and experience of the father and mother, can not double the net profits and enjoyments of the home farm. Aid us with your influence in the Legislature when we require enlarged facilities. Give us confidence and peace and quiet for growth, and do not pull up by the roots the seeds we plant and tend, from distrust whether they are planted right and growing well. The discords of the past three years in Faculty, Trustees, and Legislature have been, no doubt, overestimated. Still they have been too distressing even to mention here, except to express the belief, now apparently universal, that they are forever ended.

TO OUR STATE LEGISLATORS:

Our facilities are large, and have been equal to our absolute necessities up to the present time. But the growth of the State in prosperity and intelligence, and the growth of this College in number of students and professors, and in the courses of study, have brought certain most urgent needs for enlarged accommodations. Our endowment fund yields about $45,000 annually. But by Congressional law, "no portion of said fund, nor of the interest thereon, shall be applied, directly or indirectly, under any pretense whatever, to the purchase, erection, preservation, or repair of any building or buildings." It is sacredly devoted to salaries and incidentals of instruction, and to apparatus. Further, by its acceptance of the national land grants in 1862, our General Assembly entered into solemn contract with the College and with the Nation to erect and keep in repair all buildings necessary for the use of the College.

PRESSING WANTS OF THE COLLEGE.

What, then, are our immediate needs? In four directions they are so pressing I know not which to name first. We are overcrowded in every direction. Many of our public rooms in the Main Building must be used for three, and even four, different and partly conflicting purposes. For example, four different literary society rooms, carpeted and partly furnished by students, must be used all day long each recitation day, either for recitations or for piano or vocal lessons or practice, and once a week canvas must be removed from the carpets, and furniture exchanged and rearranged to make the rooms cheerful and inviting for society exercises. The chapel is used on Sunday for preaching service, and daily for brief religious exercises, and then, incongruously as some may think, for music room (for lessons and practice on the pipe organ and the grand piano), and at certain hours for social recreation and quiet amusement. These are but samples of our overcrowded condition. Still our facilities are large, the buildings, grounds, and apparatus having cost over $300,000. The work has simply outgrown the facilities. Seven full courses of study have been established to meet what seemed to be real and legitimate demand, to-wit:

1. The general course in the sciences related to the industries.
2. The general course for ladies, in science, literature, and domestic economy.
3. The course in agriculture and horticulture.
4. The course in mechanical engineering.
5. The course in civil engineering.
6. The course in veterinary science.
7. The post-graduate course in domestic economy. There

IS NO PREPARATORY COURSE.

The first five courses require four years each, and lead to an appropriate degree. The sixth is properly post-graduate and professional. The seventh is also post-graduate. Both lead to appropriate degrees. All these courses are equipped sufficiently for thoroughly effective work and training on the basis of past numbers and requirements. But, as remarked, the growth of the State and of the College have brought most urgent needs for enlarged accommodations in four directions, and the increased wealth of the State makes their longer postponement unnecessary and unwise. I name them in consecutive order, though each stands first in urgency.

1. A ladies' hall and dormitory, well planned, with music rooms, parlors, model kitchen, and dining rooms adapted to and with best facilities for instruction in domestic economy, including the post-graduate course. This would greatly increase the efficiency of the instruction, relieve the crowded condition of our Main Building, remove certain complications of co-education under our present dormitory system, and permit an increase in the number of ladies in attendance.

2. Five houses for professors. We are two miles from the village of Ames, with only omnibus and carriage connections. No houses can be rented nearer. Professors living at such a distance can not live in comfort, do good work, or best help build up the College. Those who board and room in the Main Building exclude just so many students, and can not, even then, have the comforts of family life. In short, our location, so far from town, makes additional houses on the College grounds for the use of professors' families an absolute and urgent necessity.

3. A building or buildings of pleasing architectural design, suitably planned for Museum and Lecture Rooms for the departments of Agriculture, Horticulture, Entomology, Zoology, and Geology.

4. An armory, to be used also as a gymnasium, and on commencement and junior exhibition and similar occasions, as an assembly room. Military tactics and drill are by law required in this College. To make the instruction and the drill effective mentally and physically, daily practice is needed, which is impossible in severe and stormy weather without a suitable armory. This can be utilized, as above indicated, for other valuable purposes.

These needs will be fully set before the proper committees of the Legislature at its next biennial session, a year from the coming winter.

Meantime Trustees and Faculty will labor faithfully so to use the large resources and equipments already placed within our reach as to gain the approval of the Legislature, of the people of the State, of our own consciences, and of Almighty God.